

HCNA-HTTD

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1. Basic Optical Communication Technology

Course Description

Chapter 1 Fiber

- 1.1 Preparatory Knowledge
- 1.2 Basics of Fiber
 - 1.2.1 Structure and Profile of Refractive Index of Fiber
 - 1.2.2 Modes of Fiber
 - 1.2.3 Loss of Fiber
 - 1.2.4 Dispersion of Fiber
 - 1.2.5 Cutoff Wavelength
 - 1.2.6 Mode-Field Diameter (MFD) and Effective Area
 - 1.2.7 Classification of SMF
 - 1.2.8 Non-linearity Effects of SMF
- 1.3 Summary and self-assessment
- 1.4 Questions

Chapter 2 Passive Components

- 2.1 Passive Components in Optical Network
 - 2.1.1 Dielectric Thin Film Filter
 - 2.1.2 Fiber Grating
 - 2.1.3 Arrayed Waveguide Grating-AWG
 - 2.1.4 Comb Filter
 - 2.1.5 Optical Coupler and Optical Splitter
 - 2.1.6 Isolator and Circulator
 - 2.1.7 Optical Switch
- 2.2 Summary and self-assessment
- 2.3 Question

2. SDH Principles

Course Description

Chapter 1 SDH Overview

- 1.1 The History of Optical Transmission Network
- 1.2 The Definition and Background of SDH
- 1.3 SDH Working Process
- 1.4 SDH Features
- 1.5 Summary
- 1.6 Question

Chapter 2 The Frame Structure and Multiplexing Method of SDH Signals

- 2.1 SDH Frame Structure
- 2.2 SDH Multiplexing
- 2.3 Summary
- 2.4 Question

Chapter 3 Overhead and Pointer

- 3.1 SDH overheads
 - 3.1.1 Section Overheads
 - 3.1.2 Path Overheads
- 3.2 SDH Pointers
 - 3.2.1 Administrative Unit Pointer——AU-PTR
 - 3.2.2 Tributary Unit Pointer——TU-PTR
- 3.3 Summary

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3.4 Question

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4.2 Logic functional block of SDH equipment

4.3 SDH Alarm Flow

4.4 Summary

4.5 Question

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5.2 Protection of survivable network

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5.2.2 Protection Rings

5.2.3 Sub-network Connection Protection

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5.4 Question

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Chapter 7 Question

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2.2 Types of Optical Fiber

2.3 Basic Features of Optical Fiber

2.4 Summary and Self-evaluation

2.5 Questions

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3.2 Photoelectric Detector

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3.6 Summary and Self-evaluation

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1.3 OTN Standards and Their Relationships

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 - 3.4 Fault Management
 - 3.5 Performance Management
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 - 3.8 NBI

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BENTLEY FIBER CERTIFICATION

MicroStation V8i

- Getting Started
- Mouse Functions
- Opening MicroStation
- Setting up a MicroStation
- Design Files
- Creating a Design File
- Accessing Menus
- Boxes
- Views
- Levels, Filters and Attributes
- Placing Elements
- Placing Lines
- Placing Arcs
- Placing Text
- Placing Cells
- Manipulating Elements
- Deleting Elements
- Copying Elements Parallel
- Modifying Elements
- Changing and Matching Element Attributes
- Grouping Elements
- Copying, Moving, Scaling, Rotating and Mirroring Elements
- Patterning Elements
- Measuring Elements
- Making Sheets
- Referencing Files
- Placing Sheets and Clipping Reference Files
- Manipulating Sheets and Filters
- Draw Box Culvert in Profile Use DGN Batch Text Editor
- Calculate and Label Slope
- Rotate Element to Horizontal
- Plotting and Making PDF's
- Plotting One Sheet
- Plotting Multiple Sheets
- Making PDF's

Introducing Bentley Map

- Introductory Knowledge
- what is Bentley Map?
- Three Bentley Map editions
- Overview features
- XFM Feature Modeling
- Data Storage
- Bentley Geospatial Administrator
- Starting Bentley Map
- Bentley Map's Interface
- Using Bentley Map
- Module Review
- Using the Map Manager
- Introductory Knowledge
- Introduction to the Map Manager
- Starting the Map Manager
- The Map Manager dialog
- Attaching Maps and Raster Images
- Attaching vector maps
- Attaching raster images
- Attaching Features
- Seamless mapping
- Managing Feature Display



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Changing the display of features
Changing the display order
Changing the display range
Changing the symbology of features
Changing Coordinate Readout
Creating layer groups
Making Features Active for Edit
Labeling and Annotating Features
Converting labels to annotation
Browsing and Searching for Features
Creating Buffers and Overlays
Module Review
Placing and Editing Features
Introductory Knowledge
XML Feature Modeling
Defining an XFM project
Using the Command Manager
Tools
Placing Features
Property based symbology (PBS)
Property based annotation (PBA)
Using plot scale
Editing Feature Properties
Editing source data
Analyzing Features
Dynamic Feature Scoring
Dynamic Feature Scoring rules
Session specific features
Promoting Features
Promoting to a simple feature
Promoting to a collection feature
Module Review
Interoperability
Introductory Knowledge
Interoperability in Bentley Map
Other GIS File Formats
Referencing GIS Files
Importing GIS Files
Using Import Settings Files (IMPX)
Saving import settings
Importing data using an import settings file
Referencing data using an import settings file
Importing CSV and ODBC Data Sources
Creating a VRT file
Importing the data
Importing GML Data Sources
Importing 3D Data
Exporting to Other GIS File Formats
Exporting to I models
Publishing i models
Bentley Map and i models
Using Bentley Map FME Extension
Importing data from FME into Bentley Map
Exporting data from Bentley Map using FME
Datasets
Filtering and schema mapping
Coordinate systems
Error handling
Module Review
Cleaning and Creating Topology



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Introductory Knowledge
Introduction Topology
Topology Cleanup
Topology Cleanup tools
Using rainbow masking
Finding duplicate line work
Finding similar line work
Finding line work fragments
Thinning linear elements
Segmenting linear elements
Finding gaps
Finding dangles
Checking quality
Connecting line work
Creating Topology
Creating centroids
Creating shapes from line work
Associating linkages
Validating topology
Splitting and merging polygons

Bentley Fiber V8i

Bentley Fiber Using Short Transaction Spatial Persistence Mode
Long Transaction Persistence with Expert Designer for Comms
Oracle Spatial Tools
Bentley Fiber Using the DGN Persistence Mode
Bentley Communications Menu
Comms-Admin
Modules
Reference Files (DGN Persistence Only)
Utilities
Help
Setup
Fiber/Copper ISP Setup
Engineering
Settings
Clear Located Devices
Erase Temp Levels
Unload
Layout
Route
Jumper
Slack
FTTP Boundary
FTTP
Insert
Insert to Existing
Merge Spans
Merge Sheaths
Move
Break
Reconnect
Connect To
Check
Post Strand Change Circles
Change
Delete
Populate
Global



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- Override
- Review
- Data
- Sheath Information
- Device Info
- Create Splice Pairs
- Cross Section
- Global
- Segment
- Number
- Review
- Check
- Connections
- Manual (Splice Enclosures)
- Modify Connected Splices
- Manual (Node Connections)
- Auto
- X-Conn
- Check
- Data Capture
- Customer Assignment
- OS/Circuit Mgr
- As Built
- Engineering Calculations
- Engineering Calculation Specification
- Input Signal Levels
- Signal Levels Calculation
- Operations
- Locate Outage
- Locate Customer
- Locate Slack
- Locate Path
- Activate Address (FTTx Design and Operations Utility)
- Work Order Example
- Confirm Activation
- Fiber Utilization
- Wavelength Utilization
- Reports
- Device Information
- Node Connectivity
- OS Trace
- Internal Report
- BOM
- Reel BOM
- FTTP BOM
- Splicing Data
- Internal BOM
- Bentley Mapping
- Railroad
- Waterline
- Lot Lines
- Roads
- Intersection Cleaning
- Building
- Base Text
- Boundary
- Cul-de-sac
- Strand Management
- Setup
- Strand Resource File



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- Edit a Strand Resource File
- Strand Mapping
- Place
- Strand Symbols
- Utility
- BOM (Strand Bill of Materials)
- GPS
- Unload
- Duct Management
- Starting the Duct Management Module
- Duct Setup
- Duct Equipment Specifications
- Place
- Enclosure
- Bundle
- Edit
- Insert
- Merge Bundle
- Connect
- Review/Change
- Modify Enclosure
- Modify Bundle
- Delete
- Reports
- BOM
- Locate Spare
- Wall Diagram

Bentley Inside Plant

- Bentley Inside Plant Using the Spatial Persistence Mode
- Long Transaction Persistence with Expert Designer for Comms
- Oracle Spatial Tools
- Bentley Inside Plant Using the DGN Persistence Mode
- Bentley Communications Menu
- Comms-Admin
- Modules
- Reference Files (DGN Persistence Only)
- Utilities
- Help
- Setup
- Equipment Specifications
- Device Assignment
- Import/Export
- Inside Plant Layout
- Floor Plan
- Place Rack
- Place Equipment
- Copy Rack
- Check Data
- Change
- Delete
- Connections
- Inside to Inside
- Inside to Outside
- Inside to Inside (Elev)
- Reports
- BOM
- Connection
- Patch and Patch 2
- Wire Run



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Rack Elevation
Build Schematic
Circuit Trace
Services
Rack Report